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The Surgery of the Ureters and Kidneys.

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Tauffer of Buda-Pesth, has an article of some seventy pages in the Archiv für Gynæcologie, Vol. XLVI., Part 3, in which he gives an account of our present knowledge upon the subject of the surgery of the ureters and kidneys to which he himself has contributed most important additions. It will be remembered that the author was associated with Hegar in the now classical case of uretero-abdominal fistula in which he succeeded in connecting the ureter with the bladder and thus saved the patient's kidney. At that time Simon's case of resection of the kidney stood alone in the literature. These two cases together with that of Nussbaum, supplied the ground work upon which the immense advances in the subject since that time have been mainly based. But although in the last fifteen years the literature has become quite abundant, the various questions which have necessarily arisen have by no means been settled. The author says, "Since the appearance of Olshausen's classical work upon "The Diseases of the Ovaries," the surgery of the uterine adnexæ has been put upon a scientific basis, and it is to be hoped that in a short while we shall be able to say the same for the surgery of the ureters and kidneys. He adds, "In the meanwhile, we are still living in the time of detail work, and it is just now that the contributions of the experienced workers may be of great service in clearing up obscure points. I therefore consider it opportune to put before you my experiences in order that I may do my share in making this one of the questions of the day in our medical researches."

After giving an account of his work and of the various cases which have come into his hands, he ends by summing

up under four heads the conclusions to which his own experience and the consideration of that of others have led him.

A. The Surgery of the Ureters.

1. The existence of an uretero-abdominal fistula is generally considered an absolute indication for nephrectomy. The study both from a clinical and pathological standpoint of injuries to the ureter occurring during operations for large abdominal tumors is as yet by no means complete.

2. In cases of accidental injury to the ureter every effort must be made to adopt some measure which will bring the ureter again into connection with the bladder before recourse is had to nephrectomy. The possibility of a plastic operation by which the cut ends of the ureter can be united is demonstrated by my cases.

3. Subperitoneal tumors which grow deep down in the pelvis and push before them the neighboring organs, not infrequently displace the ureter *en masse* so that the organ is often found in an abnormal position, and is exposed to the danger of an accidental wound. The danger becomes greater when the tumor has pushed itself up between the bladder and the ureter, and has separated these organs from one another.

4. The arteria ureterica, a branch of the renal artery the existence of which has up to the present time been almost ignored, is, in my opinion, of the greatest importance, because in trying to stop a hemorrhage deep down in the pelvis and in the neighborhood of the dislocated but unrecognized ureter we are liable to tie or cut through this organ.

5. In severe operations, the ureter is often freed from its connections for a distance of from 10 to 15 cm., and lies free in the pelvis. In these cases, this part of the organ depends for its nourishment entirely upon the arteria ureterica which is intimately connected with the fibrous capsule of the ureteral wall.

6. After difficult laparotomies, especially when stitches or ligatures have been laid deep down in the pelvis, it is of the utmost importance, before the abdominal wound is closed, to make sure that neither of the ureters has been ligated. Such an accident may be diagnosed by finding a cylindrical mass about as thick as the finger, which is formed by the ureter in which the urine is dammed up. In such cases the impediment must at all costs be removed.

7. The accidental ligation of the ureter produces a hydro-nephrosis, and later on, on account of the pressure of the sterile urine, to atrophy of the substance of the kidney. It does not necessarily endanger life.

8. In the presence of an uretero-vaginal fistula, it is advisable to first make an artificial vesico-vaginal fistula after which a plastic operation for direct closure is indicated. This at any rate must be first attempted before any more serious procedure is decided upon.

9. When a third ureter exists, and when this supernumerary ureter empties into the urethra or into the vault of the vagina, we should see whether it does not for some distance in its course run quite close to the bladder. If this is found to be the case, by an epicystotomy, it can be connected directly with the bladder after which the peripheral portion can be destroyed by means of the Paquelin cautery.

B. Nephrotomy and Nephrectomy.

1. The most recent researches in the surgery of the kidneys point to the necessity of conservative procedures.

2. My experience goes to support Favre's theory, that when the function of one ureter is interfered with by compression or ligation, the other kidney can gradually become accustomed to compensatory work, so that later on the extirpation of one kidney can be well borne, or in other words a single kidney can finally do the work of two.

3. The cause of death after the extirpation of one kidney before the other kidney has had time to accustom

itself to the increased work is almost always an acute parenchymatous nephritis.

Other experiments are necessary before we can allow the truth of Favre's theory, that this acute nephritis is due to a previous special intoxication of the blood with ptomaines.

4. Should Favre's theory be confirmed by future experimental work, as well as by clinical experience, the extirpation of the kidney at a second operation will be indicated.

5. Whenever in the course of a severe operation in the abdominal cavity, the ureter be accidentally cut, extirpation of the kidney on that side is not indicated *at the time*. If it is impossible to connect the ureter directly with the bladder an artificial uretero-abdominal fistula should be made and nephrectomy should be performed later.

6. Even with a utero-abdominal fistula, under ideal circumstances, it might be possible for the corresponding kidney to remain absolutely sound. Experience, however, shows that owing to an ascending infection, a pyelitis or even a nephritis usually follows. Consequently in the case of an uretero-abdominal fistula, nephrectomy is indicated.

7. It has been noticed that through a portion of the ureter 10 cm. long, fastened to the abdominal wound, the urine is evacuated in peristaltic rhythm. This would justify the conclusion that under normal circumstances the rhythmical flow of the urine takes place, and as a consequence of rhythmetical contractions occurring not in the ureter, but in the pelvis of the kidney.

C. Tumors of the kidney.

1. In the differential diagnosis between renal tumors, especially hydro- and pyonephrosis and ovarian tumors, errors are not uncommon. Definite clinical signs which might aid us are often absent.

2. A hydronephrotic sack can often empty itself entirely without any apparent cause, (intermittent, temporary hydronephrosis.)

3. A peritonitis following upon a puncture of a renal tumor owing to which fluid has escaped into the abdominal cavity and the consequent adhesions may render a differential diagnosis impossible.

4. A hydronephrotic sack can easily be freed from the connective tissue which holds it, provided that there has been no inflammatory complication, or that the inflammation has been confined to the peritoneum. If, however, the inflammatory process has been perirenal, the enucleation of the sack will sometimes present insuperable difficulties.

5. The contents of a hydronephrotic sac may become purulent in consequence of an ascending catarrhal infection of the bladder. In these cases, if the ureter closes, the catarrh of the bladder may get well, and thus no proof may remain that the infection came originally from the bladder.

6. In the walls of a hydronephrotic sack of moderate size, renal tissue still capable of functioning can often be found, the preservation of which is often of the greatest importance to the patient.

7. In doubtful cases, an exploratory laparotomy is indicated. Such an operation does not necessarily exclude the possibility of nephrectomy through a lumbar incision, if such be indicated.

8. When the renal tumor is combined with a retroperitoneal abscess, the operation through the peritoneum may be dangerous since the abscess cavity lies close to the abdominal cavity. It will not always be possible to recognize this complication early enough even after a preliminary laparotomy, so that whenever such a condition is suspected, the lumbar incision should be preferred.

9. In dealing with hydro- or pyonephrotic tumors, the utmost conservatism is to be recommended. The spontaneous cure of such a sack, even after the elapse of months, (in our case after 27 months,) may be expected and the patient be left with a useful kidney.

10. Tumors of the kidney developing with pregnancy, have at present been but little studied. The hydro- and pyonephrosis caused by compression of the ureter can eventually give rise to a parenchymatous nephritis. Under these circumstances the induction of premature labor is indicated.

11. In the diagnosis of renal tumors, the cystoscope plays an important role, more especially with reference to the side on which the sound or diseased kidney is situated.

D. Nephrolithiasis, Renal tuberculosis, Malignant tumors of the kidney and Nephrorraphy.

1. Calculus in the pelvis of the kidney may exist with symptoms of an ordinary pyonephrosis. It may have existed for many years without giving rise to any characteristic symptoms.

2. In cases of renal calculus nephrolithomy is indicated.

3. In any case in which a laparotomy is performed for an abdominal tumor, it is advisable to palpate both kidneys directly, and more especially when there has been any history pointing to the existence of a renal calculus, even although the symptoms may have occurred many years before.

4. In connection with the question of nephrolithotomy, it must be remembered that the formation of a calculus in the kidney is not infrequently bilateral, and that a successful operation may not therefore cure the patient.

5. The diagnosis of unilateral primary tuberculosis of the kidneys is very difficult since both the clinical and the bacteriological examinations are often unreliable.

6. The justifiability of operation in cases of unilateral primary tuberculosis of the kidney is to-day undeniable.

7. In cases of unilateral tuberculosis of the kidney, nephrectomy is indicated.

8. It may sometimes happen that in the attempt to perform a nephrotomy we may encounter an uncontrollable hemorrhage coming from the kidney tissue. In these cases, we must perforce proceed to a nephrectomy.

9. The high degree of mortality (75%) which has been observed after operation for malignant tumors of the kidney is attributable to two causes, (1) to the technical difficulties encountered during the operation, (2) to metastatic infection. Better results can be looked for from (*a*) an early diagnosis and (*b*) from greater perfection in our operative technique.

10. With respect to the frequency of the occurrence of floating kidney, the views of the authorities are at variance. In deciding how far the symptoms complained of by the patient are attributable to this condition, much depends on the opinion of the particular physician. Hence the frequency with which some proceed to operation. (Nephrorraphy.)

11. In cases of floating kidney, fixation is the result which should be aimed at, the exact position, *i. e.*, whether the kidney should be fastened a little higher up or a little lower down, seems to be of but slight importance.

12. For laying bare the kidney, the lumbar operation according to Czerny's method, seems to be the best. This is especially appropriate for the fixation of the kidney since the upper surface of the organ, when partially separated from its capsule, can be sutured directly to the lumbar fascia which has been freed from its fat.